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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,987	05/11/2006	Yoshihito Kanno	127016	1790

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EXAMINER	
PARSONS, THOMAS H	
ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/573,987	KANNO, YOSHIHITO	
	Examiner	Art Unit	
	THOMAS H. PARSONS	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 May 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *05/11/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 13 and 17-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomioka et al. (US 5,853,910).

Claim 13: Tomioka et al. in Figures 2 and 10 disclose a fuel cell system comprising:

a fuel cell (10) provided with an electrolyte membrane (col. 6: 11-23);

a circulation passage (16) through which a cathode off-gas discharged from a cathode of the fuel cell is supplied to a passage for supplying an oxygen-containing gas to the fuel cell;

a flow control unit (17) that controls a flow of the cathode off-gas in the circulation passage;

a stop control unit that stops the flow of the cathode off-gas in the circulation passage by controlling the flow control unit when the fuel cell system is stopped; and

a start-up control unit that controls the flow control unit after start-up of the fuel cell system until the fuel cell is brought into a predetermined operation state so as to hold the flow of the cathode off-gas in the circulation passage in a stopped state.

Tomioka et al. disclose in col. 7: 53-col. 8: 2, "The structure shown in FIG. 1 may be modified such that a suction valve 21 is provided for the air introducing passage 11, as shown in

FIG. 2. In this structure, air in a predetermined quantity corresponding to the degree of opening of suction valve 21 is introduced from the outside of the system into the cathode. *Then, a portion of the discharge gas is again introduced into the cathode through circulation passage 16.* On the other hand, the residual discharge gas is discharged to the outside of the system. The degree of opening of valves 16 and 21 is, as in the foregoing structure, controlled by CPU 18 in such a manner that the relationship as $A=\alpha \cdot BxC$ is satisfied while monitoring the temperature of the discharge gas and the electric current level. Thus, fuel cell 10 can be operated under an optimum water balance condition determined in accordance with the correlation between the temperature of the cell and the flow rate of the gas without need to supply water from the outside".

Further, Tomioka et al. disclose on col. 2: 40-43, "…if operation of a polymer electrolyte fuel cell power generation is interrupted" (i.e. stopped), on col. 11: 45-47, "When operation of the fuel cell is interrupted continuously for a short time (for example, one or two nights and days)…", on col. 11: 56-57, "If interruption of operation is continued for several days or longer…", and on col. 12: 15-16, "…when the apparatus is restarted and the stack temperature is raised."

Therefore, the CPU of Tomioka et al. obviously would provide the claimed stop control unit and start-up control unit.

See also entire document.

Claim 17: The recitation "wherein: the operation state of the fuel cell comprises an amount of water contained in the electrolyte membrane; and the start-up control unit holds the stopped state of the flow of the cathode off-gas until the amount of water becomes equal to or

smaller than a predetermined amount" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell.

However, because the fuel cell system of Tomioka et al. is structurally similar to that instantly claimed, it appears capable of providing the claimed process.

Claim 18: The recitation "wherein: the operation state of the fuel cell comprises an operation temperature of the fuel cell; and the start-up control unit holds the stopped state of the flow of the cathode off-gas until the operation temperature becomes higher than a predetermined temperature" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell.

However, because the fuel cell system of Tomioka et al. is structurally similar to that instantly claimed, it appears capable of providing the claimed process.

Claim 19: The recitation "wherein the start-up control unit executes a start-up control based on a predetermined map such that a circulation amount of the cathode off-gas becomes zero when the operation temperature is equal to or lower than the predetermined temperature" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell.

However, because the fuel cell system of Tomioka et al. is structurally similar to that instantly claimed, and discloses executive maps (see Figure 3) it appears capable of providing the claimed process.

Claim 20: The recitation "wherein: the operation state of the fuel cell comprises a total power generation amount accumulated from the start-up of the fuel cell; and the start-up control unit holds the stopped state of the flow of the cathode off-gas until the total power generation

amount exceeds a predetermined amount" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell.

However, because the fuel cell system of Tomioka et al. is structurally similar to that instantly claimed, it appears capable of providing the claimed process.

Claim 21: The recitation "wherein: the operation state of the fuel cell comprises an elapsed time from the start-up of the fuel cell; and the start-up control unit holds the stopped state of the flow of the cathode off-gas until the elapsed time reaches a predetermined time" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell.

However, because the fuel cell system of Tomioka et al. is structurally similar to that instantly claimed, it appears capable of providing the claimed process.

Claim 22: The recitation "wherein: the operation state of the fuel cell comprises a hydrogen consumption amount obtained from the start-up of the fuel cell; and the start-up control unit holds the stopped state of the flow of the cathode off-gas until the hydrogen consumption amount reaches a predetermined amount" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell.

However, because the fuel cell system of Tomioka et al. is structurally similar to that instantly claimed, it appears capable of providing the claimed process.

Claim 23: The recitation " wherein the stop control unit executes a stop control based on an outside temperature" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell.

However, because the fuel cell system of Tomioka et al. is structurally similar to that instantly claimed, it appears capable of providing the claimed process.

Claim 24: As set forth above in claim 13, Tomioka et al. disclose a method of operating a fuel cell system comprising:

supplying an oxygen-containing gas to a fuel cell (10) provided with an electrolyte membrane (col. 6: 11-23);

circulating a cathode off-gas discharged from a cathode of the fuel cell (via 15, 16) to a passage (11) through which the oxygen-containing gas is supplied;

stopping a circulation of the cathode off-gas when the fuel cell system is stopped; and holding the circulation of the cathode off-gas in a stopped state until the fuel cell is brought into a predetermined operation state after start-up of the fuel cell system.

3. Claim 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomioka et al. as applied to claim 13 above, and further in view of Kobayashi et al. (US 2001/0053469).

Tomioka et al. are as applied, argued, and disclosed above, and incorporated herein.

Claim 14: Tomioka et al. do not disclose that the flow control unit includes an inlet that admits the cathode off-gas discharged from the cathode, a first outlet to which the circulation passage is connected, a second outlet through which the cathode off-gas is discharged to a passage other than the circulation passage, and a selector unit that selects between the first outlet and the second outlet for discharging the cathode off-gas admitted through the inlet.

Kobayashi et al. disclose a flow control unit that (25) includes an inlet that admits the cathode off-gas discharged from the cathode, a first outlet to which the circulation passage is

connected, a second outlet through which the cathode off-gas is discharged to a passage other than the circulation passage, and a selector unit (i.e. switcher) that selects between the first outlet and the second outlet for discharging the cathode off-gas admitted through the inlet (paragraph [0062]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the fuel cell of Tomioka et al. by incorporating the flow control unit and selector unit of Kobayashi et al. because Kobayashi et al. teach flow control unit and selector that would have provided a means for rapidly warming up a fuel cell and effectively utilizing the moisture remaining in the interior of the fuel cell.

As set forth above in claim 13, the stop control unit of the Tomioka et al. combination obviously closes the first outlet that has been selected by the selector unit so as to stop the flow of the cathode off-gas in the circulation passage; and the start-up control unit of Tomioka et al. obviously hold the first outlet that has been selected by the selector unit closed so as to hold the flow of the cathode off-gas in the circulation passage in the stopped state.

Claim 15: Tomioka et al. do not disclose that the flow control unit includes an inlet that admits the cathode off-gas discharged from the cathode, a first outlet to which the circulation passage is connected, a second outlet through which the cathode off-gas is discharged to the passage other than the circulation passage, and a selector valve having a valve body, which selects between the first outlet and the second outlet for discharging the cathode off-gas admitted through the inlet.

Kobayashi et al. disclose a the flow control unit includes an inlet that admits the cathode off-gas discharged from the cathode, a first outlet to which the circulation passage is connected,

a second outlet through which the cathode off-gas is discharged to the passage other than the circulation passage, and a selector valve (25) having a valve body, which selects between the first outlet and the second outlet for discharging the cathode off-gas admitted through the inlet (paragraph [0062]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the fuel cell of Tomioka et al. by incorporating the flow control unit and selector unit of Kobayashi et al. because Kobayashi et al. teach flow control unit and selector that would have provided a means for rapidly warming up a fuel cell and effectively utilizing the moisture remaining in the interior of the fuel cell.

As set forth above in claim 13, the stop control unit of the Tomioka et al. combination obviously closes the first outlet that has been selected by the selector unit so as to stop the flow of the cathode off-gas in the circulation passage; and the start-up control unit of Tomioka et al. obviously hold the first outlet that has been selected by the selector unit closed so as to hold the flow of the cathode off-gas in the circulation passage in the stopped state.

Claim 16: Tomioka et al. do not disclose that the flow control unit includes the inlet that admits the cathode off-gas discharged from the cathode, the first outlet to which the circulation passage is connected, the second outlet through which the cathode off-gas is discharged to the passage other than the circulation passage, a first switching valve that allows the cathode off-gas admitted through the inlet to flow into the first outlet, and a second switching valve that allows the cathode off-gas admitted through the inlet to flow into the second outlet.

Kobayashi et al. disclose a flow control unit includes the inlet that admits the cathode off-gas discharged from the cathode, the first outlet to which the circulation passage is connected,

the second outlet through which the cathode off-gas is discharged to the passage other than the circulation passage, a first switching valve that allows the cathode off-gas admitted through the inlet to flow into the first outlet, and a second switching valve that allows the cathode off-gas admitted through the inlet to flow into the second outlet (paragraph [0062]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the fuel cell of Tomioka et al. by incorporating the flow control unit and selector unit of Kobayashi et al. because Kobayashi et al. teach flow control unit and selector that would have provided a means for rapidly warming up a fuel cell and effectively utilizing the moisture remaining in the interior of the fuel cell.

As set forth above in claim 13, the stop control unit of the Tomioka et al. combination obviously closes the first outlet that has been selected by the selector unit so as to stop the flow of the cathode off-gas in the circulation passage; and the start-up control unit of Tomioka et al. obviously hold the first outlet that has been selected by the selector unit closed so as to hold the flow of the cathode off-gas in the circulation passage in the stopped state.

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS H. PARSONS whose telephone number is (571)272-1290. The examiner can normally be reached on M-F (7:00-3:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795

Thomas H Parsons
Examiner
Art Unit 1795

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